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David J. Wetherall

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HOUSTON ELISEEVA
4 MILITIA DRIVE, SUITE 4
LEXINGTON, MA 02421

EXAMINER

BIAGINI, CHRISTOPHER D

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/706,503	Applicant(s) WETHERALL ET AL.	
	Examiner Christopher Biagini	Art Unit 2442	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-14,16,18-27,29,31-39,41-45,47,48 and 56-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-14,16,18-27,29,31-39,41-45,47,48 and 56-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This communication is in response to the amendments filed September 1, 2009 and December 9, 2009. Claims 1, 3, 5-14, 16, 18-27, 29, 31-39, 42-45, 47, 51-54, and 56-59 are pending. Claims 1, 14, 27, 48, and 57 are amended. Claims 46 and 55 are cancelled. Claim 59 is new.

Election/Restrictions

Applicant's arguments with respect to the restriction requirement have been fully considered and are persuasive. Accordingly, the requirement is withdrawn.

Allowable Subject Matter

The indicated allowability of claims 48 and 57 (the limitations of which are now present in claim 59) is **withdrawn** in view of the newly discovered reference(s) to Ko et al. (US Patent No. 6,789,202). Rejections based on the newly cited reference(s) follow.

Response to Arguments

Applicant's arguments filed September 1, 2009 have been fully considered but they are not persuasive.

Regarding the argument that claims 48 and 57 "should still be deemed allowable for the reasons set forth in the pending Office Action," the Examiner respectfully disagrees. As admitted

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by the applicant, the claims are now “broader than the previous versions.” Thus, this argument fails to comply with 37 CFR 1.111(b) because it amounts to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Regardless, the argument is now moot in view of the new ground(s) of rejection.

Regarding the argument that the combination of Malan, Poletto, and Katoh do not teach “lowering priority of traffic sourced from a network” because the Katoh patent merely teaches priority lowering, the Examiner respectfully disagrees. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In this case, Malan, for example, teaches the monitor/regulator instructing the first routing device to block the undesirable network traffic that is being sourced from the first network domain in response to making said determination that the first network domain is sourcing the undesirable network traffic (see discussion of “StormBreaker” at p. 14 of provisional application 60/231,380). In other words, this differs from the claimed invention only insofar as the monitor/regulator blocks the traffic outright rather than lowering its priority. Katoh, on the other hand, teaches lowering the priority of undesirable traffic as an alternative to blocking it outright (see col. 4, lines 10-13). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Malan to lower the priority

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of undesirable traffic as taught by Katoh in order to achieve the predictable result of easing congestion caused by the attack without running the risk of blocking innocent traffic entirely.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 10-16, 18, 27, 29, 31, 36-39, 42, 43, 47, 51, 52, 56, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malan et al. (US Pub. No. 2002/0032871, hereinafter “Malan”) in view of Poletto et al. (US Pub. No. 2002/0032880, hereinafter “Poletto”), and further in view of Katoh et al. (US Patent No. 5,949,757, hereinafter “Katoh”).

Note that Malan claims priority to and incorporates by reference three provisional applications: Nos. 60/231,479, 60/231,480, and 60/231,481, all filed on September 8, 2000. Except where noted below, all page and line numbers cited in connection with Malan refer to those in application No. 60/231,680. Since the numbering of the pages is inconsistent throughout the application, the numbers will refer to the pages as they were scanned into the PTO records (i.e., with page 1 being the cover sheet).

Similarly, Poletto claims priority to and incorporates by reference provisional application No. 60/230,759, filed September 7, 2000. Except where noted below, all page and line numbers cited in connection with Poletto refer to those in application No. 60/230,759. Since the

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numbering of the pages is consistent throughout the application, the numbers will refer to the pages as they are labeled (i.e., with page 1 corresponding to the third scanned sheet in the application).

Regarding claim 1, Malan shows:

- a first network domain (for example, an enterprise network: see first paragraph under “StormDetector” on p. 12);
- a first routing device (comprising an attacker’s router) at a boundary between the first network domain and public internetworking fabric (comprising an ISP network: see Fig. 4 and the paragraph spanning pp. 14-15) to route network traffic between the first network domain and the public internetworking fabric (implicitly disclosed as the typical functionality of a first-hop router: see last paragraph on p. 12);
- a monitor/regulator (comprising the StormDetector analysis engine), either integrally disposed in said first routing device or coupled to the first routing device (see second paragraph under “StormDetector” on p. 12 and Figs. 2 and 4) to monitor the network traffic routed by said first routing device by analyzing flow records (comprising “flow statistics”: see second and third paragraphs under “StormDetector” on p. 12 and note that StormDetector can be used in “source and transit networks” and “an attacker’s originating network”), describing traffic conversation as indicated by a combination of source and destination addresses (comprising “flow statistics” as described above, further explained as being indicated by a combination of source and destination addresses in the paragraph spanning pp. 3-4), received from the routing device (note

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that the analysis engine receives flow statistics from all the routers in the attack path, including the attacker's router: see "StormProfiler" on p. 11), the monitor/regulator determining if the first network domain is sourcing undesirable network traffic (comprising determining that the attack originates in the enterprise network: see paragraph spanning pp. 14-15), comprising a denial of service attack in which the undesirable network traffic is launched against a target network device (for example, a target web hosting server: see "StormDetector" on p. 12 and "StormBreaker" on p. 14) in order to undermine the operation of that target network device by overwhelming the target network device with network traffic (typical of denial of service attacks, and further explained at the first paragraph on p. 3), out of the first network domain (note that the attacker must send the traffic out of the enterprise network in order for it to reach the web host);

Malan further shows:

- wherein said monitor/regulator makes said determination based on identifying malicious traffic at the routing device using network profiling (see "StormDetector" on p. 12, and note that StormDetector "instantly identify[ies] malicious traffic" and can be "employed at an attacker's originating network"), and
- wherein said monitor/regulator instructs the first routing device to block the undesirable network traffic that is being sourced from the first network domain in response to making said determination that the first network domain is sourcing the undesirable network traffic (see discussion of "StormBreaker" at p. 14).

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Malan does not *explicitly* show:

- wherein said monitor/regulator makes said determination based at least in part on differential characteristics based on differential characteristics between request packets routed out of said network domain, and response packets routed into the network domain, and
- wherein the monitor/regulator instructs the first routing device to lower the priority of the undesirably network traffic.

Poletto shows identifying malicious traffic at a routing device (comprising a gateway) based on differential characteristics (comprising a ratio of request packets to acknowledgement packets) between request packets routed out of said network domain (comprising client request packets which are routed out of an attacker's domain), and response packets routed into the network domain (comprising server acknowledgement packets which are routed into the attacker's domain: see pages 15-16). Because both Malan and Poletto teach methods for identifying malicious traffic at a routing device, it would have been obvious to one of ordinary skill in the art to substitute one method for the other in order to achieve the predictable result of determining that the network domain is sourcing undesirable traffic.

Katoh teaches lowering the priority of undesirable traffic as an alternative to blocking it outright (see col. 4, lines 10-13). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Malan to lower the priority of undesirable traffic as taught by Katoh in order to achieve the predictable result of easing congestion caused by the attack without running the risk of blocking innocent traffic entirely.

Regarding claim 3, the combination further shows wherein said monitor/regulator infers said differential characteristics based on aggregated statistics of said network traffic routed out of said network domain, and aggregated statistics of said network traffic routed into the network domain (comprising maintaining an analysis of the ratio over time, which necessarily involves maintaining information about the number of packets routed into and out of the domain). Note that in the combination described above, the ratio monitoring process of Poletto is executing on the routers of Malan, including the attacker's router. Thus, a request packet from the attacker would be routed out of the attacker's network domain (such as the enterprise network), and response packets would be routed into the attacker's network domain.

Regarding claim 5, the combination further shows wherein said monitor/regulator, upon determining undesirable network traffics are being sourced out of said first domain, further stops said undesirable network traffic from being sourced out of said first domain (see Malan, paragraph spanning pp. 14-15).

Regarding claim 10, the combination further shows wherein

- said network further comprises a second network domain (ISP-B) including a second routing device (comprising a router in ISP-B) for routing network traffic out of and into the second network domain (see Fig. 2 on p. 13 of Malan);
- said monitor/regulator further monitors the network traffic routed by said second routing device (note that the system of Malan monitors traffic statistics sent from ISP routers: see second paragraph on p. 11 and Fig. 2 of Malan), and determines if

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at least a selected one of the first and second network domains is sourcing undesirable network traffic out of the selected one of the first and second network domains based on network traffic characteristics observed of network traffic routed through said first and second routing devices (comprising determining that the first network is the location of the attacker: see "StormDetector" on p. 12 of Malan).

Regarding claim 11, the combination further shows wherein said monitor/regulator determines if undesirable network traffics are being routed out of said first network domain through said first routing device based on network traffic characteristics observed of network traffic routed through said second as well as said first routing device (note that the analysis engine collects statistics from all routers in the attack path in order to track attacks to their source: see "StormTracker" on p. 13 of Malan).

Regarding claim 12, the combination further shows wherein said monitor/regulator determines if undesirable network traffics are being routed out of said second network domain through said second routing device based on network traffic characteristics observed of network traffic routed through said first as well as said second routing device (note that the analysis engine collects statistics from all routers in the attack path in order to track attacks to their source, and further note that the system would detect the source of the attack regardless of which domain it originated in: see "StormTracker" on p. 13 of Malan).

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Regarding claim 13, the combination further shows wherein said monitor/regulator, upon determining undesirable network traffics are being sourced out of at least a selected one of said first and second network domains, further stops said undesirable network traffic from being sourced out of said first and second network domains (see paragraph spanning pp. 14-15, and note that the system would stop traffic at the source of the attack regardless of which domain it originated in).

Regarding claim 42, the combination further shows wherein said monitor/regulator generates statistics concerning destination addresses and determines whether the first network domain is sourcing undesirable network traffic based on said statistics (see discussion of “flow-based statistics” in paragraph spanning pp. 3-4 of Malan).

Regarding claim 43, the combination further shows wherein said monitor/regulator generates statistics concerning lengths of packets and determines whether the first network domain is sourcing undesirable network traffic based on said statistics (see discussion of “single packet statistics” in paragraph spanning pp. 3-4 of Malan).

Regarding claim 47, the combination further shows wherein said monitor/regulator instructs a routing device to slow the undesirable network traffic (comprising slowing the attack traffic to zero: see paragraph spanning pp. 14-15 of Malan).

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Claims 14, 16, 18, 27, 29, 31, 36-39, 51, 52, and 56 correspond to claims 1, 3, 5, 10-13, 42, 43, 47 and are rejected for the same reasons as given above.

Claim 58 is an apparatus claim which corresponds to claim 1 as addressed above. However, the claim includes the additional limitations of (a) the monitor/regulator generating statistics concerning destination addresses to determine whether the network domain is sourcing the undesirable network traffic, and (b) wherein said monitor/regulator instructs the routing device to lower a priority of the undesirable network traffic and/or slow the undesirable network traffic. It is noted that Malan teaches these additional features. Malan teaches the monitor/regulator generating statistics concerning destination addresses to determine whether the network domain is sourcing the undesirable network traffic (see discussion of “flow-based statistics” in paragraph spanning pp. 3-4), and further teaches wherein said monitor/regulator instructs the routing device to slow the undesirable network traffic (comprising slowing the attack traffic to zero: see paragraph spanning pp. 14-15).

Claims 6-9, 19-26, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malan (US Pub. No. 2002/0032871) in view of Poletto (US Pub. No. 2002/0032880), and further in view of Katoh (US Patent No. 5,949,757) and Li (US Patent No. 5,473,599).

Regarding claim 6, the combination does not show wherein said first network domain further comprises a second routing device for routing network traffic out of and into the first

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network domain; and said monitor/regulator further monitors the network traffic routed by said second routing device, and determines if the first network domain is sourcing undesirable network traffic out of the first network domain based on network traffic characteristics observed of network traffic routed through said first and second routing devices.

Li shows a network domain comprising a second routing device for routing network traffic out of and into the network domain (see col. 7, lines 30-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Malan with the second routing device taught by Li in order to reduce the burden on the first routing device.

Note that such a combination would result in said monitor/regulator further monitoring the network traffic routed by said second routing device, and determining if the first network domain is sourcing undesirable network traffic out of the first network domain based on network traffic characteristics observed of network traffic routed through said first and second routing devices, since Malan teaches that all the routers in a network's routing infrastructure are used for collecting data: see first paragraph under "StormProfiler" on p. 11).

Regarding claim 7, the combination further shows wherein said monitor/regulator determines if undesirable network traffics are being routed out of said first network domain through said first routing device based on network traffic characteristics observed of network traffic routed through said second as well as said first routing device (note that all the routers in a network's routing infrastructure are used for collecting data: see first paragraph under

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“StormProfiler” on p. 11).

Regarding claim 8, the combination further shows wherein said monitor/regulator determines if undesirable network traffics are being routed out of said first network domain through said second routing device based on network traffic characteristics observed of network traffic routed through said first as well as said second routing device (note that the analysis engine collects statistics from all routers in the attack path in order to track attacks to their source: see “StormTracker” on p. 13 of Malan).

Regarding claim 9, the combination further shows wherein said monitor/regulator, upon determining undesirable network traffics are being sourced out of said first network domain, further stops said undesirable network traffic from being sourced out of said first network domain (note that the analysis engine collects statistics from all routers in the attack path in order to track attacks to their source, and further note that the system would detect the source of the attack regardless of where it originated: see “StormTracker” on p. 13 of Malan).

Claims 19-26 correspond to claims 6-13 and are rejected for the same reasons as given above.

Claims 32-35 correspond to claims 6-9 and are rejected for the same reasons as given above.

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Claims 44 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malan (US Pub. No. 2002/0032871) in view of Poletto (US Pub. No. 2002/0032880), and further in view of Katoh (US Patent No. 5,949,757) and Carr (US Patent No. 5,293,379).

Regarding claim 44, the combination further shows wherein said monitor/regulator generates statistics concerning distributions of various fields in TCP/IP packet headers (see discussion of “single-packet statistics” in paragraph spanning pp. 3-4 of Malan) and determines whether the first network domain is sourcing undesirable network traffic based on said statistics, but does not show that the statistics are generated using time to live values.

Carr shows that TCP/IP packet headers include time to live values (see Fig. 4 and col. 5, lines 27-36). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the TTL field taught by Carr along with the statistics generation taught by Malan in order to provide an additional basis for determining that traffic is malicious.

Claim 53 corresponds to claim 44 and is rejected for the same reason as given above.

Claims 45 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malan (US Pub. No. 2002/0032871) in view of Poletto (US Pub. No. 2002/0032880), and further in view of Katoh (US Patent No. 5,949,757) and Galloway (US Patent No. 5,430,709).

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Regarding claim 45, the combination further shows wherein said monitor/regulator tracks differences between outbound transmission control protocol (TCP) synchronize (SYN) and inbound response packets (ACKs) and determines whether the first network domain is sourcing undesirable network traffic based on said differences (see Poletto, pp. 16-17).

The combination does not show tracking differences between finish (FIN) packets and inbound response packets.

Galloway shows that finish (FIN) packets should elicit ACK packets in response (see Fig. 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Malan to track FIN packets in order to provide an additional basis for determining that traffic is malicious.

Claim 54 corresponds to claim 45 and is rejected for the same reason as given above.

Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Malan (US Pub. No. 2002/0032871) in view of Poletto (US Pub. No. 2002/0032880), and further in view of Kato (US Patent No. 5,949,757) and Ko et al. (US Patent No. 6,789,202, hereinafter “Ko”).

Regarding claim 59, the combination further shows:

- a second network domain (ISP-B) including a second routing device (comprising a router in ISP-B) for routing network traffic out of and into the second network domain (see Fig. 2 on p. 13 of Malan);

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- wherein said monitor/regulator further monitors the network traffic routed by said second routing device (note that the system of Malan monitors traffic statistics sent from ISP routers: see second paragraph on p. 11 and Fig. 2 of Malan), and determines if at least a selected one of the first and second network domains is sourcing undesirable network traffic out of the selected one of the first and second network domains based on network traffic characteristics observed of network traffic routed through said first and second routing devices (comprising determining that the first network is the location of the attacker: see "StormDetector" on p. 12 of Malan).

The combination does not explicitly show wherein said monitor/regulator, upon determining undesirable network traffics are being sourced out of at least one of said first and second network domains, lowers a threshold for concluding that undesirable network traffic are being sourced out of an other one of said first and second network domains.

Ko shows a upon determining a network attack is occurring at one network domain (e.g., detecting an attack a first local network), lowers a threshold for concluding that a network attack is occurring at another network domain (e.g., concluding that fewer password tries are necessary to trigger a security response at a second local network; see col. 4, lines 30-39 and col. 5, lines 7-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Malan to lower thresholds in response to determining attacks as taught by Ko in order to allow respond more quickly to a large-scale coordinated attack (see Ko, col. 1, lines 15-28).

Claims 48 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malan (US Pub. No. 2002/0032871) in view of Ko (US Patent No. 6,789,202).

Regarding claim 48, Malan shows a network comprising:

- a first network domain (for example, an enterprise network: see first paragraph under “StormDetector” on p. 12);
- a first routing device (comprising an attacker’s router) at a boundary between the first network domain and public internetworking fabric (comprising an ISP network: see Fig. 4 and the paragraph spanning pp. 14-15) to route network traffic between the first network domain and the public internetworking fabric; (implicitly disclosed as the typical functionality of a first-hop router: see last paragraph on p. 12) and
- a second network domain (ISP-B) including a second routing device (comprising a router in ISP-B) for routing network traffic out of and into the second network domain (see Fig. 2 on p. 13 of Malan);
- a monitor/regulator (comprising the StormDetector analysis engine) that monitors the network traffic routed by said first routing device and said second routing device (comprising “flow statistics”: see second and third paragraphs under “StormDetector” on p. 12 and note that StormDetector can be used in “source and transit networks” and “an attacker's originating network”), and determines if at least a selected one of the first and second network domains is sourcing undesirable network traffic out of the selected one of the first and second network

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domains (note that the system of Malan monitors traffic statistics sent from ISP routers: see second paragraph on p. 11 and Fig. 2 of Malan) based on network traffic characteristics observed of network traffic routed through said first and second routing devices (comprising determining that the first network is the location of the attacker: see "StormDetector" on p. 12 of Malan).

Malan does not explicitly show wherein said monitor/regulator, upon determining undesirable network traffics are being sourced out of at least one of said first and second network domains, lowers a threshold for concluding that undesirable network traffic are being sourced out of an other one of said first and second network domains.

Ko shows a upon determining a network attack is occurring at one network domain (e.g., detecting an attack a first local network), lowers a threshold for concluding that a network attack is occurring at another network domain (e.g., concluding that fewer password tries are necessary to trigger a security response at a second local network; see col. 4, lines 30-39 and col. 5, lines 7-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Malan to lower thresholds in response to determining attacks as taught by Ko in order to allow respond more quickly to a large-scale coordinated attack (see Ko, col. 1, lines 15-28).

Claim 57 corresponds to claim 48 and is rejected for the same reasons as given above.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER D. BIAGINI whose telephone number is (571)272-9743. The examiner can normally be reached on weekdays from 8:30 AM to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571) 272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher Biagini
(571) 272-9743

/Shawki S Ismail/
Primary Examiner, Art Unit 2455